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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT: William R. Voight et al

SERIAL NO: 09/766,025 ART UNIT: 3722

FILED: January 19, 2001

FOR: HELICAL ROTARY CUTTER AND METHOD

EXAMINER: Brian D. Walsh

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. BOX 1450
Alexandria, Virginia 22313-1450

July 19, 2004

S i r:

APPELLANTS' REPLY BRIEF

This brief is submitted in reply to examiner's answer mailed May 19, 2004.

(I). REAL PARTY IN INTEREST

William R. Voight and Dennis F. Sauer, the applicants and appellants are the real parties in interest. There have not been any changes of the parties in interest since the appeal brief was filed.

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Date: July 19, 2004

Robert L Farris

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Robert L. Farris

(type or print name of person certifying)

(II). RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which have a bearing on the Board's decision in this appeal, as stated in appellants' brief.

RESPONSE TO ARGUMENTS

Appellants' failure to number the pages of the brief is regretted. There are seven pages string with the page with (1). REAL PARTY IN INTEREST and ending with the signature page. Appellants attach a copy of their brief, as APPENDIX D with page numbers added to ensure that there are no misunderstandings.

Samuels et al states in column 4, lines 23-26:

"Across the length of 17 (perpendicular to the cross section shown in Figure 3), 20 may be parallel to 13 or may be helically disposed to 13, with essentially the entire length of 20 being at a constant distance from 13."

That statement means that an hourglass affect does not exist or can be ignored and is clearly false. The presence of an hourglass affect can be clearly observed by laying a straight edge on a cylindrical surface with a straight edge parallel to the long axis of the cylindrical surface and then rotating the center of the straight edge (half way between the ends of the cylindrical surface) about a radius of the cylindrical surface a few degrees. It will be noted that both ends of the straight edge move away from the cylindrical surface. The few degrees represents a helix angle. The ends of the straight edge, in this example can be moved back to the cylindrical surface by making a groove in the cylindrical surface that is closer to the axis of rotation, midway between the ends of the cylindrical surface, then the ends of the straight edge.

A helix angle greater than 0° introduces additional variables

that must be considered to obtain a satisfactory rotary cutter. If a straight edge member is rotated about a radius of the cylindrical surface at one end of the cylindrical surface, the angle between the surface of the straight edge, that corresponds to appellants' groove wall 26 or 28 shown in Figure 2, and the radius will be a different angle at the other end because the radius at the other end will not be parallel to the radius at the one end. In fact, the angle of appellants' groove walls 26 and 28 to a radius of the cylindrical member changes constantly along the axis of the cylindrical member from one end of a rotor to another end.

Appellants' blades 34 are rectangular and are all as close to identical as the manufacturing process can make them. Since the angle of a blade surface, that contacts a groove wall 26 or 28, relative to a rotor radius changes from one end to the other of each blade 34, the radial height of a blade also changes. The radial height of the base support surface 30, 40, 42, and 44, shown schematically in Figure 9, also change from one end to the other of a rotor assembly. The rotor base supports are all different and unique at sections 4, 5, 6, 7, and 8.

The changes that occur as a result of a helix angle θ, shown in appellants' drawing Figure 3, are accounted for when manufactured as described in the specification. The dimensions given are for a rotor with a specific diameter. If the rotor diameter is changed, the other dimensions also change.

The horizontal lines in Figure 5A of Samuels et al appear to be parallel. The wedge shown in Figure 6A is rectangular and extends the entire length of the rotor. The wedge does not, therefore, correct for the change in the width of a groove in a rotor that occurs due to the hourglass affect. The groove is wider between rotor ends than it is at the ends. Wedges for clamping the blades are each a wedge shape in an axial direction. The rotor shown in appellants' Figure 3 has four wedges in each rotor groove. For these reasons it is clear that Samuels et al discloses a

rotary cutter without a helix angle even though a helix angle is mentioned.

Two planes which do not intersect each other are parallel. Two planes which intersect each other cannot both be perpendicular to a third plane unless the third plane is perpendicular to the intersection line between the two planes. Parallel planes can both be perpendicular to a third plane.

Page 5 of the examiner's answer includes a figure on the left that corresponds to Figure 2 of Samuels et al. Figure 2 is a conventional polymer cutter. The right figure on page 5, of the examiner's answer, corresponds to Figure 1 of Samuels et al. Figure 1 discloses the Samuels et ál invention. The lines added to the left and right figures in the examiner's answer indicate that each blade base surface is in a blade base plane that is perpendicular to one groove wall only.

Appellants' claim 1 includes a first groove wall in a first wall plane that intersects the rotor axis and a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and wherein all of the base support planes that are perpendicular to said first groove wall intersect each other. Samuels et al does not show or suggest a plurality of first base support planes that are perpendicular to a first wall plane. Samuels et al shows one wall surface and one wall base support surface in a base support plane that is perpendicular to the first wall plane. Appellants' claim 1 also states that the first groove wall extends outward from the rotor axis and in the direction of rotation, and includes a plurality of first rectangular flat cutter blades each of which is seated on one of the plurality of first support surfaces.

Appellants' claim 7 includes a first wall plane that intersects the rotor axis, a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and wherein all the base support planes that are perpendicular to the first wall plane

intersect each other. Samuels et al could not have two base planes that are perpendicular to a first groove wall if there is a helix angle and the first groove plane extends away from the rotor axis and in the direction of rotation. Appellant's Figure 5 shows no two base planes that are perpendicular to one groove wall. Figure 9 shows appellants' new structure.

Appellants' claim 11 includes the steps of machining a first groove wall and a first wall plane that intersects the rotor axis, and machining a plurality of first base support surfaces and a plurality of first base support planes that are perpendicular to the first wall plane. Samuels et al does not show or suggest such structure.

Appellants' claim 12 includes a first groove wall and a first wall plane that extends from the left end to the right end of the rotor, and extending away from the rotor axis and in the direction of rotation. The claim also includes a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and includes the limitation that all the base support planes that are perpendicular to the first wall groove intersect each other. Samuels et al would have only one base plane that is perpendicular to the first groove wall if the first groove wall extends outward and in the direction of rotation from the axis of rotation. A plane cannot intersect itself. Samuels therefore fails to disclose or suggest the structure set forth in appellants' claim 12.

Appellants' claim 13 includes a first groove wall and a first wall plane that intersects the rotor axis, a plurality of first base support surfaces each in a base support plane that is perpendicular to the first wall plane and wherein all the base support planes that are perpendicular to the first groove wall intersect each other. Samuels et al has only one base support plane that is perpendicular to the first groove wall as shown by the drawings on page 5 of the examiner's answer. When there is a helix angle and the groove wall extends outward and in the direction of rotation from the axis of rotation, Samuels et al will have only one base support plane that is

perpendicular to the first wall groove.

Rotor manufacturers have tried for years to make cutter rotors with a plurality of rectangular cutter blades clamped to each groove wall and a helix angle. Their efforts have not been successful. Conair Corp. the manufacturer of the rotor of Figure 2 of the Samuels' et al patent was one of the companies that was unsuccessful. Appellants' were the first ones to solve all the problems associated with such a helical rotor. Appellants' have not eliminated the hourglass affect in helical rotors. They have merely reduced the hourglass affect to an acceptable level and solved a number of other problems associated with helical rotary cutters. Some of the related problems are discussed above.

It is believed that all the claims are clearly patentable over the prior art of record. Accordingly, reversal of the final rejection and allowance of the application are requested.

Respectfully submitted,

William R. Voight et al

By their attorney,

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APPENDIX D

appeal brief with page numbers added
and without original appendices A, B, and C

IN THE UNITED STATES PATENT AN TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTEREFERENCES

APPLICANT: William R. Voigt

SERIAL NO: 09/766,025 ART UNIT: 3722

FILED: January 19, 2001

FOR: HELICAL ROTARY CUTTER AND METHOD

EXAMINER: Brian D. Walsh

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

April 7, 2004

S i r:

APPELLANTS'BRIEF

This brief is submitted in support of appellant's appeal from the decision of the patent examiner dated July 14, 2003 finally rejecting claims 1, 3-5, 7, 8 and 11-14 under 35 U.S.C.§ 102(a) as being anticipated by Samuels et al., Claim 2 under 35 U.S.C. 103(a) as being unpatentable over Samuels et al in view of Meis, and Claims 9 and 10 under 35 U.S.C.§ 103(a) as being unpatentable ever Samuels et al. A copy of the appealed claims appears in Appendix A attached hereto.

CERTIFICATION 37 C.F.R. 1.8a and 1.10
(Express Mail Label number is mandatory)
(Express Mail certification is optional).

I hereby certify that, on the date shown below, this correspondence is being:

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Bambi L. Straebel
Signature
Bambi L. Straebel

Date: April 7, 2004

(I). REAL PARTY IN INTEREST

William R. Voigt and Dennis F. Sauer, the applicants and appellants are the real parties in interest.

(II). RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellants' legal representative which will be directly affected by or have a bearing on the Board's decision in the pending appeal.

(III). STATUS OF THE CLAIMS

Claims 1, 3-5, 7, 8, and 11-14 are finally rejected under 35 U.S.C.§ 102(e) as being anticipated by Samuels et al. Claim 2 is finally rejected under 35 U.S.C.§ 103(a) as being unpatentable over Samuels et al Patent No. 6,247,389 (Appendix B) in view of Meis Patent No. 5,163,45 (Appendix C).

Claims 9 and 10 are finally rejected under 35 U.S.C.§103(a) as being unpatentable over Samuels et al.

(IV). STATUS OF AMENDMENTS

After the response by appellants filed January 2, 2003, no amendments to the claims were made or entered. The examiner considered the claims as amended January 2, 2003 and finally rejected claims 1-15 on July 14, 2003.

(V). SUMMARY OF THE INVENTION

Appellants invention relates to a helical rotary cutter for cutting a plurality of strands of hot plastic forced through an plurality of extrusion dies as the strand are being simultaneously cooled by water. The cutter cuts the strands into small plastic pellets. The pellets are fed mechanically from hoppers and heated to a molten state and formed

into a variety of products. These products can be molded or extruded. Tl
be formed into film. The pellets must be cut cleanly on both ends to redu
plastic hair like members on their ends. Hair members are objectionable !
inhibit feeding of pellets from storage hoppers.

Appellant's rotary cutters have a rotor with a plurality of g
extend the length of the rotor. A first groove wall in a first wall plane ext
from the left end to the right end, extends outward away from the rotor ax
direction of rotation and the first wall plane intersects the rotor axis. A pl
base support surfaces are each in a base support plane that is perpendicul
wall plane. The base support planes that are perpendicular to the first gro
intersect each other. A plurality of rectangular flat cutter blades each hav
on one of the plurality of first base support surfaces. At least one clamp
the plurality of first rectangular flat cutter blades to the first groove wall.
The plurality of first base support surfaces hold each rectangular blade cl
first groove wall with each cutting edge of each cutter blade the same radi
from the rotor axis of rotation. The hourglass effect of each blade is redu
one thousandth of an inch with the rotor dimensions disclosed in the spec
addition to minimizing the hourglass effect, the base support surfaces alsc
change in the radial height from one end to the other and of each cutter bl
the first groove wall. The use of rectangular cutter blades makes it possit
damaged blades in the field without removing the rotor from the cutter th
down time to hours rather than weeks due to minor blade damage.

(VI) ISSUES

1. Whether Claims 1, 3-5, 7, 8, and 11-14 are anticipated by Samuels et al.
2. Whether Claim 2 is unpatentable over Samuels et al in view of Meis.
3. Whether Claims 9 and 10 are unpatentable over Samuels et al.

(VII). GROUPING OF CLAIMS

Dependent Claims 2-5 stand or fall together with independent Claim 1.

Dependent Claims 8-10 stand or fall together with independent Claim 7.

Independent Claim 11 stands or falls on its own merits.

Independent Claim 12 stands or falls on its own merits.

Dependent claim 14 stand or fall together with independent Claim 13.

(VIII). ARGUMENTS

1. Issue 1 – Whether Claims 1, 3-5, 7, 8 and 11-14 are anticipated by Samuels et al.

Claim 1 includes a plurality of first rectangular flat cutter blades clamped to the first groove wall. The base of each of the plurality of first rectangular cutter blades is seated on one of the plurality of first base support surfaces. The plurality of first base support surfaces are each in a base support plane that is perpendicular to the first wall plane and the first base support planes intersect each other. The first wall plane intersects the rotor axis. The first wall plane also extends outward from the rotor axis and in the direction of rotation. Each of the above limitations in Claim 1 is important. The first wall plane extending outward and in the direction of use is required to insure the blades cut rather than shear. It also insures that the first wall plane does not include the axis of rotation. The first wall plane also intersects the

rotor axis because there is a helix angle. The first base support surfaces intersect each other so that they can reduce the hourglass effect and correct for variation in the radial height of each rectangular cutter blade from one end to the other due to the helix angle. The plurality of cutter blades clamped to the first groove wall requires multiple blades on one wall in each groove and at least two intersecting base support surface planes associated with the first groove wall.

Samuels et al shows a rotor with a plurality of grooves and no helix angel. The blades are also intended to shear rather than cut. Figure 5A indicates that there is no helix angle. Each blade 2 extends the length of the rotor. There is one base support surface that cooperates with each groove wall. There are two base support surfaces associated with each wall surface plane. However, these base supports are 180° apart and are parallel to each other. Samuels et al does not provide any information on how the problems introduced by a helix angel would be handled. In view of the above Claim 1 is patentable over Samuels et a.

Claims 2-6 that are dependent on Claim 1 are patentable together with Claim 1.

Claim 7 includes a rotor having at least one groove, a first groove wall and a second groove wall. A plurality of first base support surfaces are perpendicular to the first wall plane and intersect each other. A plurality of second base support surfaces are each perpendicular to the second wall plane and intersect each other. A plurality of first rectangular flat cutter blades are each mounted on one of the plurality of the first base support surfaces. A plurality of second rectangular flat cutter blades are each mounted on one of the plurality of second base support planes. A plurality of clamp

members each clamp one of the plurality of first rectangular flat clutter blades to one of the plurality of first base supports and one of the plurality of second rectangular flat cutter blades to one of the plurality of second base supports. The first and second grove walls are part of the at least one groove. Samuels et al does not have at least one groove with all the structure set forth. Claim 7 is therefore patentable.

Claims 8-10 which are dependent upon Claim 7 are patentable together with Claim 7 for reasons set forth above.

Claim 11 is directed to a method of making a helical rotary cutter. The method includes machining a plurality of grooves in a steel cylinder. A first groove wall is machined in each of the plurality of grooves. A plurality of first base support surfaces in a plurality of first base support planes that intersect each other are machined in each of the grooves. A second groove wall is machined in each of the plurality of grooves. A plurality of second base support surfaces in a plurality of second base support planes that intersect each other are machined in each of the grooves. Rectangular cutter blades are mounted on each first base support and each second base support.

Samuels et al does not disclose or suggest a rotary cutter with a groove, a first groove wall and a plurality of first base supports in first base support planes that intersect each other and are perpendicular to the first groove wall. Claim 11 is therefore patentable over Samuels et al.

Claim 12 includes a helical rotary cutter including a rotor with a plurality of grooves and a first groove wall. A plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and intersect

each other. A plurality of first rectangular flat cutter blades each have a base seated on one of the first base support surfaces. At least one clamp member clamps the plurality of first rectangular cutter blades to the first groove wall. Samuels et al does not suggest a groove with a plurality first base support surfaces in intersecting planes, plurality of cutter blades each of which is seated on one of the base support surfaces and at least one clamp clamping the plurality of first rectangular blades to the first groove wall. Claim 12 is therefore patentable.

Claim 13 includes a helical rotary cutter with a rotor having a plurality of grooves, a first groove wall and a second groove wall, and a plurality of a first base support surfaces each in base support planes that intersect each other and at least one clamp member clamping the plurality of cutter blades seated on the plurality of first base support surfaces to the first groove wall. Samuels et al does not show or suggest a plurality of cutter blades clamped to a first groove wall and to a plurality of base support support surface in intersecting planes. Claim 13 is therefore patentable over Samuels et al.

Claim 14 is dependent on Claim 13 and is patentable together with claim 13 for reasons set forth above.

2. Whether Claim 2 is unpatentable over Samuels et al in view of Meis.

Claim 2 is dependent upon Claim 1 and is patentable over Samuels et al for reasons set forth above.

3. Whether Claims 9 and 10 are unpatentable over Samuels et al.

Claims 9 and 10 are dependent on Claim 7 and are patentable together with Claim 7 for reasons set forth above. It is also noted that Claim 9 includes four

first base support surfaces and four second base support surfaces. Each of the first base support surfaces cooperates with the first groove walls and is in a plane that is perpendicular to the groove wall. Samuels et al discloses two walls that are 180° apart and in a common wall plane. There are only two base support planes that are perpendicular to one plane of Samuels et al.

Claim 9 includes four first base support surfaces in four planes and four second base support surfaces in four planes. The four planes are different from each other. No two of the rotor sections extending along the rotor axis as disclosed in the application are identical in size or shape.

(IX). APPENDIX

A. Claims

B. Samuels et al Patent No. 6,247,389

C. Meis Patent No. 5,163,490

It is believed that all the claims on appeal are clearly patentable over the prior art of record. Accordingly, reversal of the final rejection and allowance of the application are requested.

Respectfully submitted,

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